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ABSTRACT

Twenty-nine learning disabled (LD) students in grades 1-4 were compared with non-LD students on comprehension of relative clauses. Ss were given baseline, 2-way, and 3-way reversible sentences to test comprehension and examine strategy differences. Results showed that LD students performed more poorly than non-LD students for all sentence types at each grade level. However, the question of whether LD necessarily involves a language deficit was not resolved because of the overlapping distribution of scores within each grade. The author suggests that attention deficits detected during testing may be responsible for some of the test scatter. (CL)

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Does Learning Disabled Equal Language Disabled?

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Introduction

A number of studies report language impairment in learning disabled (LD) children: in their vocabulary development (Wiig & Semel, 1976; Fry, Johnson & Muehl, 1970); in lexical retrieval (Denkla & Rudel, 1976; Wolf, in press); and in production and comprehension of morphological and syntactic structures (Fry, et al., 1970; Moran & Byrne, 1977; Vogel, 1975; Wiig & Semel, 1976). Further, recent studies have attempted to show that an underlying language deficit accounts for the poor reading performance of LD children (Wolf, in press; Vellutino, 1978).

The present study is designed to examine whether learning disabled can be equated with language disabled by (1) comparing normal and LD children's comprehension of relative clauses; (2) determining whether LD children use similar or different strategies during acquisition; and (3) comparing individual LD children and individual normals for their comprehension and strategies.

Relative clauses, like passives, offer insight into how children acquire structures in which the surface structure does not correspond to the deep structure. Researchers have explored a number of different kinds of strategies children might use when they encounter these problematic syntactic structures, including strategies based on knowledge of the real world, semantic constraints, grammatical function, and word order.

As an example of a study demonstrating that children use world knowledge as a strategy, Strohner and Nelson (1974) and Bever (1970) report that 3-year-olds, when presented with improbable sentences, both active and passive, such as

1. The dog pats the mother
2. The boy is pushed by the truck

consistently ignore word order and interpret the sentences according to their knowledge of the real world - so mothers pat dogs and boys do the pushing.

Semantic constraints are believed to account for children's greater difficulty in imitating, understanding, and producing reversible as compared with nonreversible passives (e.g. Turner & Rommetveit, 1967). Sentence (4) is harder on all these measures than (3), because in (4) either the lion or the tiger may eat one another, but in (3) 'food' cannot eat the tiger.

3. The food is eaten by the tiger.
4. The lion is eaten by the tiger.

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As an example of acquisition strategies based on function, Sheldon (1974, 1975) claimed that sentences in which the relativized noun has the same function in the main clause and in the embedded clause are easier than sentences in which the relativized noun has a different function in the two clauses. In (5), 'customer' is the subject of the main clause and the subject of the embedded clause:

5. The customer that yelled at the waiter pinched the cook.

Therefore (5) is easier to understand than (6), because in (6) 'customer', while still the subject in the main clause, now functions as the object of the embedded clause.

6. The customer that the waiter yelled at pinched the cook.

The majority of researchers have pursued acquisition hypotheses based on word order in the surface structure. Three representative word-order strategies are explored in the present experiment:

Strategy 1. Assign agent role to the first noun in a sequence, including an NNV... sequence. (Bever, 1970)

Strategy 2. Assign agent role to the noun immediately preceding the verb, including in an NNV... sequence (Lempert & Kinsbourne, 1978, 1980).

Strategy 3. Treat multiple clause sentences as conjoined simple sentences (Tavakolian, 1978).

Word order strategies are used here to test whether being learning disabled means the child has a language deficit, because changes with age in the use of word order strategies such as these are easy to demonstrate. Therefore, use of these strategies can be tested as a function of grade (age) and group (LD and normal).

The Experiment

Stimuli. The present experiment controls for probability and reversibility. Three series of sentences were tested: Baseline, 2-way reversible, and 3-way reversible sentences. The 3 series, with an example of each sentence type, are shown in Table 1. There were 8 instances of each sentence type, or a total of 16 Baseline, 24 2-way reversible and 32 3-way reversible sentences.

Table 1

The Three Series of Test Sentences with Examples

A. Baseline
   (1) Active. The man is eating the fish.
   (2) Full Passive. The man is being eaten by the fish.

B. Relative Clauses in Two-Way Reversible Sentences
   (1) Active. The sheriff that robbed the indian had a fat belly.
   (2) Full Passive. The sheriff that got robbed by the indian had a fat belly.
   (3) Truncated Passive. The sheriff that the indian robbed had a fat belly.

C. Relative Clauses in Three-Way Reversible Sentences
   (1) SS. The customer that yelled at the waiter pinched the cook.
   (2) SO* The customer that the waiter yelled at pinched the cook.
   (3) OS. The customer yelled at the waiter that pinched the cook.
   (4) OO. The customer yelled at the waiter that the cook pinched.

* SO stands for the function of the relativized noun (underlined in the example sentence) within the two clauses. In the SO example sentence, customer is the subject (S) of the main clause, "The customer pinched the cook," and the object (O) of the relative clause, "The waiter yelled at the customer."

For each test sentence, a picture pool represented all the possible relationships among the NP's in the sentence. The child's task was to point to the picture that matched the orally presented sentence. The Baseline sentences required only 2 pictures. Figure 1 shows the pictures the child saw for the Baseline Active, "The man is bathing the elephant." The artist is Elaine Carroll.

Each 2-way reversible sentence required a picture pool of 4 pictures. Figure 2 shows the picture set for the sheriff and the indian sentences given in Table 1.

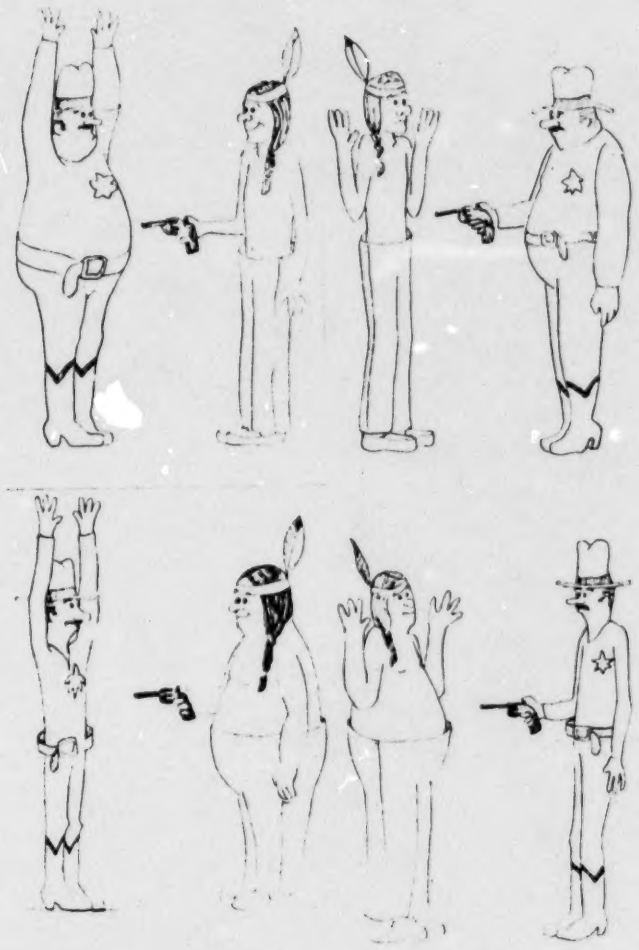

Figure 2

Drawings are by Elaine Carroll

Four pictures are needed because either the sheriff or the indian may be the robber, and either may be graced with a fat belly.

Twelve pictures are needed to represent all the possibilities for the 3-way reversible sentences, and the child must choose two of these for each sentence - one picture for each clause. In the sample sentences in Table 1, the customer, waiter and cook can each pinch each other and yell at each other. Figure 3 (see next page) shows the picture series for the 4 3-way reversible

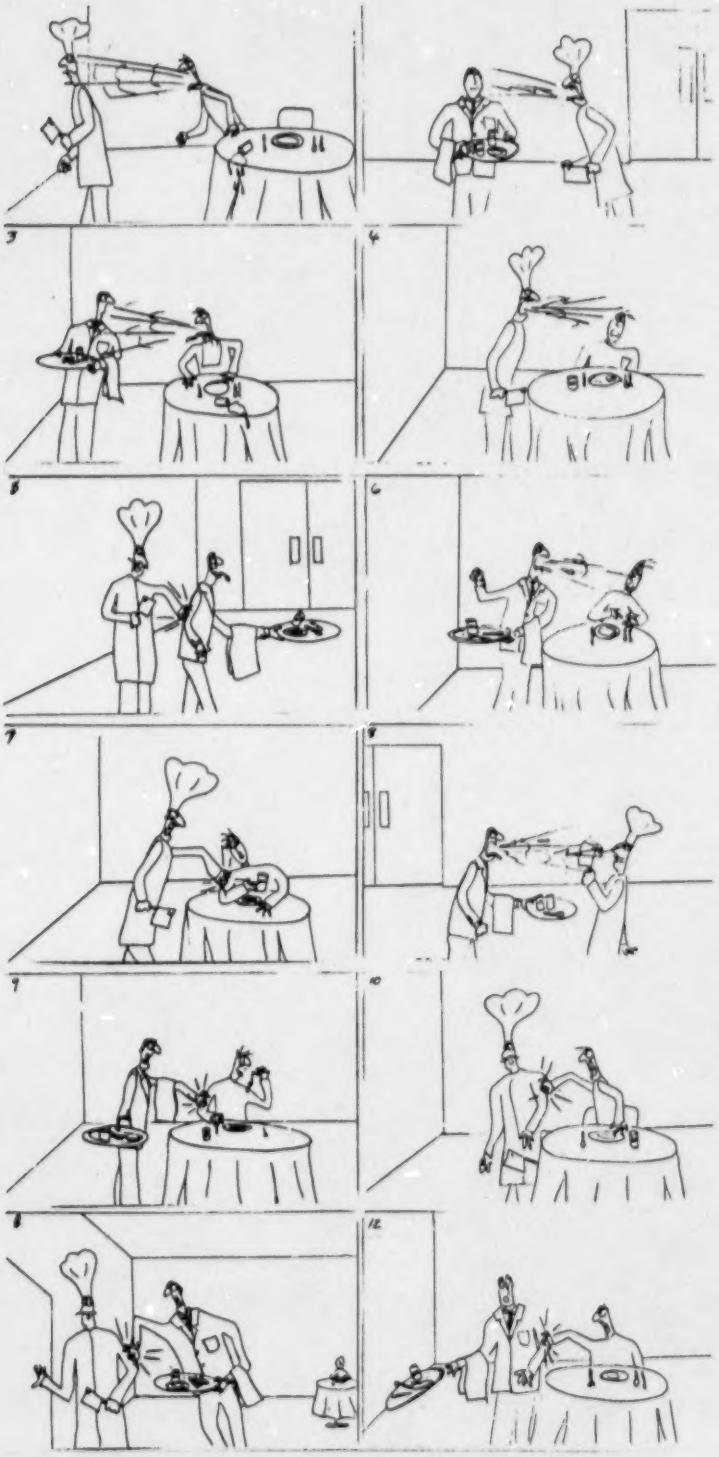

Figure 3

sentences about the waiter, cook and customer. The artist for Figure 3 is Eric Wirth.

The pictures were mounted in random order on firm posterboard and then clearly numbered in each corner. The sets for the 3-way reversible sentences were reduced in size so that the 12 pictures fit on one board. To control for placement effect, several different sets of cards were made.

Method. Practice examples were given for the Baseline and 3-way reversible sentences. Children were tested individually on two different days. On day 1 half the children did the 3-way reversible sentences, completing the Baseline and 2-way reversibles on the second day. This order was reversed for the rest of the sample. The sentences presented during each test session were randomly ordered.

The child sat across from the experimenter at a table and spread the cards for each sentence in front of himself. The experimenter repeated the sentence as often as the child wished. The experimenter ignored the pictures (which were upside down to him) and simply recorded the number of the picture to which the child pointed. Thus the experimenter tested the 2- and 3-way reversible sentences without knowing whether the child's response was correct.

Subjects. Learning disabled children were selected in accordance with the Federal criteria on the basis of their performance on a number of tests. Specifically, their reading score on the Woodcock-Johnson was lower than 42, yet their IQ and performance on at least one other school task were within the normal range. The LD children thus found were then matched for age and IQ with other children from the same classroom for the control, or normal sample. All children were drawn from one parochial school in Chicago. Most families were lower middle class. Only native English monolingual children were included in the sample. Table 2 shows the distribution of subjects by grade (1-4) and group (LD and normal).

Table 2

Distribution of Subjects by Grade and Group

	Grade			
	1	2	3	4
Group				
Learning Disabled	9	7	6	7
Normal	9	7	5	6

Benefits of picture test. Other researchers with relative clauses have generally used toys as stimuli (e.g. Sheldon, 1974, 1975; Tavakolian, 1978; de Villiers, Tager Flusberg, Hakuta & Cohen, 1979), the child's task being to make the toys act out the experimenter's sentence. An example sentence (de Villiers et al.) would

be: "The turkey that kissed the alligator licked the camel." While the child's movement of the toys may not always be clear, his response in the picture task is unambiguous, and he is forced to give a response to each clause.

Results

The results are presented in three parts. First, combining LD and normal children at each of the 4 grade levels, the percent correct are reported. Next, percent correct for LD and normal children are compared at each level. Finally, LD and normal children are compared for their use of strategies.

Baseline. Virtually all children at all grade levels were 100% correct in their responses to the Baseline sentences. However, the few errors made were to Passive stimuli and by LD children.

Two-Way Reversible Sentences Containing a Relative Clause. Table 3 shows the correct responses, in percents, to the three types of 2-way reversible sentences as a function of grade. Comprehension of Active 2-way sentences, such as "The sheriff that robbed the indian had a fat belly," improves steadily with grade, from 63% correct in grade 1 to 94% correct in grade 4.

Table 3

Correct Responses to the 3 Types of 2-Way Reversible Sentences, in Percents, as a Function of Grade.

	Grade			
	1	2	3	4
Sentence Type				
Active	63	81	88	94
Full Passive	54	69	70	73
Truncated Passive	41	35	49	41

Full Passives, such as "The sheriff that got robbed by the indian had a fat belly," also improve with grade, although by 4th grade only three-quarters of the responses are correct, instead of nearly all. However, as Table 3 shows, there is no improvement for Truncated Passives, of the type "The sheriff that the indian robbed had a fat belly." First and 4th graders alike give correct responses only 41% of the time.

Three-Way Reversible Sentences Containing a Relative Clause. Four kinds of 3-way reversible sentences were tested (see Table 1). In general, all of them improved with age, although at a gradual rate, as is shown in Table 4. The task proved too lengthy for the first graders, who needed about an hour for the 32 3-way reversible sentences. Therefore they were asked to do only half of them, namely, the SS and SO types.

The order of difficulty of the four sentence types replicates Sheldon's (1974) finding that SS and OO sentences are easiest to understand.

Table 4

Correct Responses to the 4 Types of 3-Way Reversible Sentences, in Percents, as a Function of Grade.

	Grade			
Sentence Type	1	2	3	4
SS	67	63	70	72
OO*	--	53	55	57
OS*	--	47	46	53
SO	27	28	29	33

*First graders were not tested on OO and OS sentences.

The Effect of Group. When the children within each grade are divided according to learning disabled and normal, a significant difference in performance is found at each grade level.

Leland Wilkenson, a remarkable psychologist at the University of Illinois at Chicago Circle, helped me analyze the results. Using a computer program he developed (MANOVA), a multivariate analysis of variance on these results with grade (4 levels), group (2 levels: LD, normal) in the model showed grade significant ($p < .01$), and group significant ($p < .0001$), and grade by group not significant ($p < .75$).

The relatively poor performance of the LD children obtains for all sentence types tested at all grades. These results are displayed in Table 5, which gives the LD and normal children's correct responses, in percents, to 2-way and 3-way reversible sentences. Consider, for example, the LD and normal children's responses to the OS sentences. Neither group improves between 2nd and 4th grade; the LD children give about 30% fewer correct responses. Or look at the LD and normal responses to Active two-way reversible sentences. Both LD and normal children improve with age; but at each age, the LD children produce fewer correct responses.

Table 5

Correct Responses to 2- and 3-way Reversible Sentences, in Percents by Grade, as a Function of Group.

LD = Learning Disabled; N = Normal

2-Way Reversible Sentences

Sentence Type	Grade 1		2		3		4	
	LD	N	LD	N	LD	N	LD	N
Active	60	67	77	84	79	100	93	96
Full Passive	47	61	59	80	60	83	75	73
Truncated Passive	35	47	29	39	31	63	29	54

3-Way Reversible Sentences

SS	46	88	61	66	52	94	59	88
OO*			52	63	44	72	41	75
OS*			38	67	31	69	39	69
SO	22	32	18	38	21	41	20	48

* First graders were not tested on OO and OS sentence types.

From such data it is easy to conclude that learning disabled does equal language disabled. Before turning to analyses of strategies, I want to weaken this conclusion. Table 6 displays the distribution of correct responses (out of a possible 24) to the 2-way reversible sentences (summed over all 3 types) by grade, as a function of group. Looking at the children in grade 1, Table 6 shows that 6 LD children and 4 normals gave 6-12 correct responses. On the average, the LD first graders gave 11.3 correct responses, whereas the normal first graders averaged 13.9 correct responses. Again, the LD children at all 4 grade levels generally give fewer correct responses than the normals. But Table 6 shows the vitally important fact that some normal children perform as poorly as the worst LD's, and some LD children give as many correct responses as the best normals in the same grade. Therefore, Table 6 shows that disruption in language cannot unilaterally account for learning disablement.

Table 6

Distribution of Correct Responses (raw numbers) to 2-way Reversible Sentences by Grade as a Function of Group

LD = Learning Disabled, N = Normal

Number of Correct Responses (out of 24)

Grade	Group	Number of Children	6-12	13-18	19-24	Average
1	LD	9	6	3	0	11.3
	N	9	4	4	1	13.9
2	LD	7	4	3	0	13.3
	N	7	1	4	2	16.1
3	LD	6	3	2	1	14 2
	N	5	0	3	2	19.4
4	LD	7	0	6	1	15.7
	N	6	0	3	3	17.8

Strategies. Given the descriptions of strategies in the literature, it should be relatively easy to examine minimal pairs of test sentences for which differing predictions would be made. For example, compare SS and OS:

(7) SS: The customer that yelled at the waiter pinched the cook.
OS: The customer yelled at the waiter that pinched the cook.

Strategy 2 (Assign agent role to noun immediately preceding verb) predicts that the second clause in SS sentences will be misinterpreted as waiter pinch cook, because 'waiter' immediately precedes 'pinched.' For the same reason, Strategy 2 (S_2) predicts that OS sentences will be correctly interpreted. Strategy 3 (Treat multiple clause sentences as conjoined simplex sentences) makes the opposite set of predictions. Namely, children will (correctly) interpret the second clause of the SS sentence as customer pinch cook, because Strategy 3 (S_3) interprets SS sentences as the conjoined simplex sentences, customer yell at waiter, (and) customer pinch cook. For the same reason, S_3 predicts children will misinterpret OS sentences to mean the same as SS. These contrasting predictions are shown in Table 7.

Table 7

Minimal Pair Contrast Between Responses to SS and OS Sentences, as Predicted by Strategies 2 and 3

Strategy 2 (S_2): Assign agent role to noun immediately preceding verb.

Strategy 3 (S_3): Treat multiple clause sentences as conjoined simplex sentences.

SS: The customer that yelled at the waiter pinched the cook.

S_2: Customer yell at waiter, waiter pinch cook.
S_3: Correct

OS: The customer yelled at the waiter that pinched the cook.

S_2: Correct
S_3: Customer yell at waiter, customer pinch cook.

Now assume that S_3 is a more mature strategy than S_2. These predictions follow: (1) Lower grades will use more Strategy 2 responses for both correct (OS) and incorrect (SS) responses. (2) Higher grades will use more Strategy 3 responses for correct (SS) and incorrect (OS) responses. (3) LD children, if their language is delayed, will use more S_2 responses in higher grades than normals, and fewer S_3 responses; and normal children will use more S_3 responses at all ages.

Figure 4 shows that the first two predictions are supported. The overall S_2 responses decrease with age: erroneous S_2 responses peak at 78% in 2nd grade, decreasing to 42% in 4th. The more mature S_3 becomes a more frequent error as grade increases, accounting for 82% of the incorrect responses to OS sentences in grade 4.

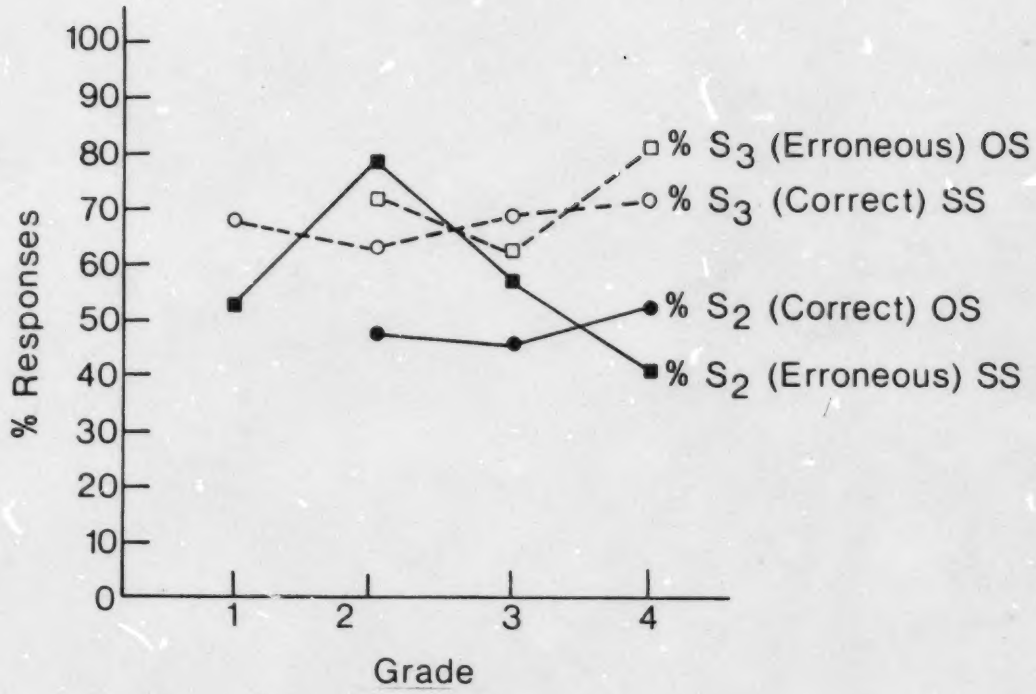

Figure 4

Correct S_2 and S_3 Responses, in Percents to SS and OS Sentences, Contrasted with Percent of S_2 and S_3 Errors for these sentences.

A comparison of LD and normal children (Figure 5) shows that, as expected, at each age normal children use more S_3 responses than do the LD's of the same grade, and LD children use more of the young or S_2 responses in the higher grades than do normal children. This is the first of many indicators that LD children have delayed language - they are using the same strategies as younger normal children.

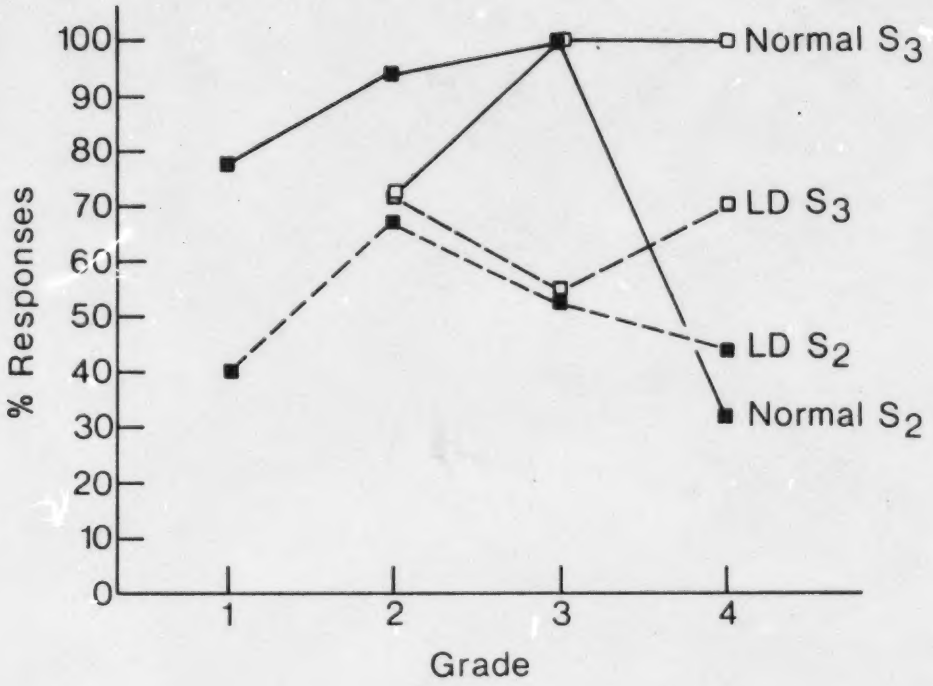

Figure 5

Erroneous S_2 and S_3 Responses, in Percents, to SS and OS Sentences Respectively, as a Function of Grade and Group.

The fact that LD children are using the same strategies as normals, but applying them at somewhat later ages, is more strongly shown when the 2-way Reversible Active and 3-way Reversible SS are compared. This comparison also demonstrates the decrease in use of S_2 with age, already seen in Figure 4.

(8) Active: The fireman that sprayed the boy chased the truck.
SS: The fireman that sprayed the boy chased the girl.

The two sentences are identical except in degree of reversibility.

Figure 6 shows that normal children virtually eliminate S_2 erroneous responses by grade 4, whereas S_2 errors still account for nearly half the erroneous responses of the grade 4 LD children. Notice that the LD curves match the normal curves (LD children are using the same strategy), but the use of S_2 declines later.

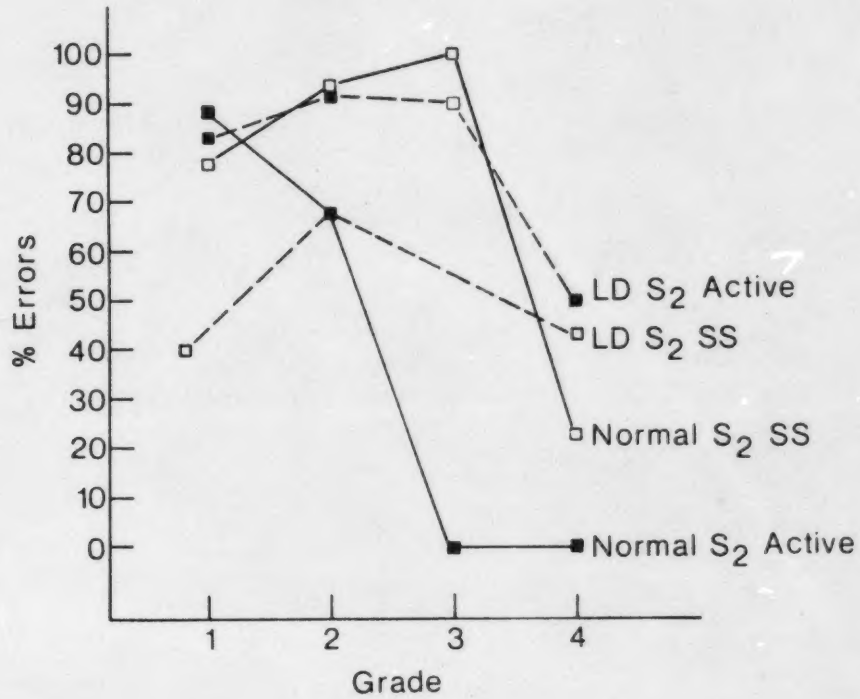

Figure 6

S_2 Responses to 2-way Reversible Active and 3-way Reversible SS Sentences, in Percents, as a Function of Grade and Group

Pursuit of these minimal pair contrasts yields further support for the claim that LD children use the same strategies

normal children do. Further, these minimal pair contrasts provide revealing information about which strategies are used more frequently as age increases. The most startling finding concerns erroneous responses to the two types of 2-way reversible sentences containing the Passive, namely, Full Passives and Truncated Passives:

(9a) Full Passive. The sheriff that got robbed by the indian had a fat belly.
(9b) Truncated Passive. The sheriff that the indian robbed had a fat belly.

Before displaying the actual results, consider the reasonable expectations about what the results should be.

The Baseline series was intended to demonstrate that all the children, both LD and normal, comprehended the simple Passive construction. While very few errors were made, only one or occasionally 2 out of the 8 possibilities for each child, virtually all errors were made by LD children. Even so, errors in Baseline Passive did not predict errors in the 2-way reversible Full Passive. For example, only one child missed 3 Baseline Passives: his performance was 100% correct on the more difficult 2-way reversible Full Passives. Thus, the Baseline sentences did show that the children knew the Passive.

If a child errs on a 2-way reversible Full Passive, what response does he give? Strategy 1 (Assign agent role to first-named NP, including in an NNV sequence) and Strategy 2 (Assign agent role to NP immediately preceding the verb, including in an NNV sequence) both predict that the child will assign agent role to the first noun in an NVN sequence such as the Full Passive, so in (9a) the sheriff robs the indian. To avoid confusion in the following discussion, this response is called Ignore Passive, without attribution to either S_1 or S_2. Strategy 2 assigns agent role to the noun preceding the verb in the second NV(N) sequence too, so in (9a) the indian has the fat belly. The evidence from the Baseline Passive makes it unlikely that children will ignore the Passive (applying S_1 or S_2 to the first clause). These children apparently know that Full Passives involve the surface structure reversal of the agent and patient nouns: they do not apply these strategies to the Baseline set. Therefore, reasonable expectations are that (1) older children will make few errors on the Full Passive; and (2) those errors that older children do make will be of the S_2 type where S_2 is applied to the second clause.

Figures 4 and 5 have shown the decrease of S_2 with age: we already know that older children are unlikely to use S_2. So what error do older children make for Full Passives in 2-way reversible sentences? The surprising result is that older children increasingly ignore the Passive, and normal children are as likely to do so as LD's. When Truncated Passive sentences are analyzed, this finding is further supported: older, and normal children increasingly ignore the Passive, as evidenced by the number and kind

of errors they make. These results are shown in Table 8 for the 2-way reversible Full Passives and Truncated Passives.

Table 8

Erroneous Responses, in Percents, to Full Passive and Truncated Passive Two-Way Reversible Sentences, by Grade and by Group.

S_2= Assign agent role to NP immediately preceding V (applied to second clause)

Full Passive

	Grade 1		2		3		4	
	LD	N	LD	N	LD	N	LD	N
S_2	71	52	78	91	50	67	64	50
No Passive + S_2	13	24	18	9	20	0	7	0
No Passive	16	24	4	0	30	33	29	50

Truncated Passive

S_2	45	39	20	50	18	27	28	23
No Passive + S_2	25	21	35	18	33	13	43	32
No Passive	30	39	45	32	48	60	30	45

Recall that, for 2-way reversible sentences, the child selects the correct picture from a pool of 4. In the Full Passive sentence in (9a), the child can err by (1) applying S_2 to the second clause, so the indian has the fat belly (the first row in Table 8); (2) ignoring the Passive in the first clause (the third row in Table 8); or (3) doing both (1) and (2) - applying S_2 and ignoring the Passive (the middle row in Table 8).

Looking just at normal children's use of S_2 in Table 8: for both Full Passive and Truncated Passive sentences, S_2 asymtotes at second grade (91% and 50% respectively), and steadily declines by fourth grade (50% and 23% respectively) - a familiar finding. Normal children seem to consistently attend to the Passive in second grade: 2nd grade No Passive responses are 0% for Full Passives and 32% for Truncated Passives. But older children increasingly ignore the Passive: 4th grade No Passive responses are 50% for Full Passives and 45% for Truncated Passives.

While older children do make fewer errors to Full Passives than younger children (Table 3), they are far from perfect; and, counter to prediction, older children err not by applying S_2, but by ignoring the Passive. Notice that ignoring the Passive is a more frequent response for 4th grade normals than for 4th grade LD's, and that the LD's often apply S_2 as well, whereas normals rarely do.

While the 3 rows in Table 8: S_2, No Passive + S_2, and No

Passive, account for all the possible errors, the more interesting comparison is to contrast all instances of application of S_2 (both where S_2 is the only error and where the Passive was ignored as well) with all instances of ignoring the Passive (both where this was the only error and where S_2 was applied as well). This comparison is shown in Figure 7, for each grade as a function of group, for erroneous responses to the 2-way reversible Full Passive.

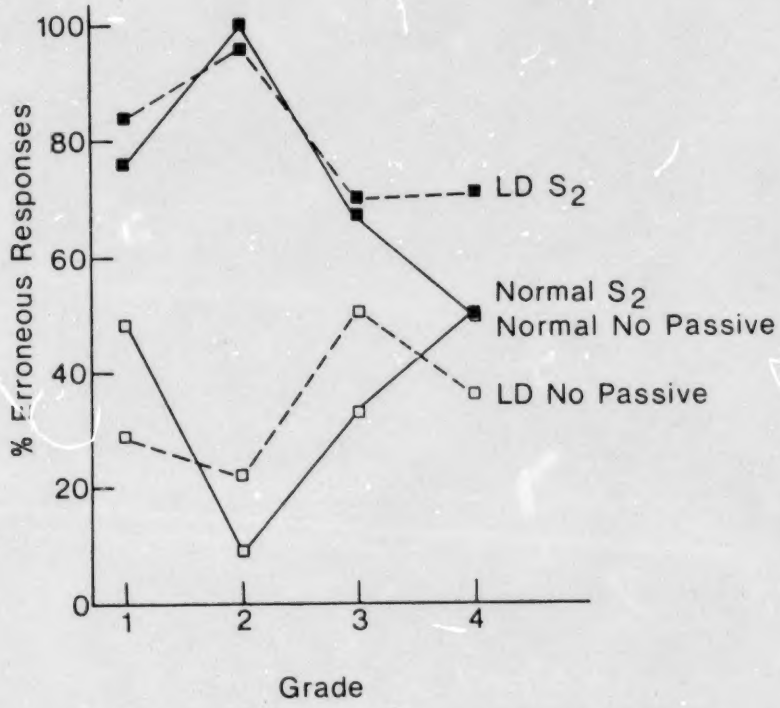

Figure 7

S_2 and No Passive Responses to 2-Way Reversible Full Passive Sentences, by Grade, as a Function of Group. Points sum to more than 100% because responses including both S_2 and No Passive are counted twice. S_2 = assign agent role to NP immediately preceding V in second clause.

Figure 7 shows the familiar drop in S_2 responses; and ignoring the Passive accounts for 50% of the erroneous responses to Full Passives, and over 75% of those to Truncated Passives. Refer back to Table 8. It would be fascinating to see what 5th graders do.

"Ignoring the Passive" is a cop-out description of the child's behavior, labeled from the adult view, in which the child fails to give the proper response. These data permit a more sophisticated analysis and comparison of the accuracy of the 3

word order strategies included here, and the sequence in which they are acquired; as well as analysis of other hypotheses, such as function. Since function seems a far more sophisticated parsing mechanism than conjunction, for example, it is tempting to translate "ignoring the Passive" into a function strategy. These analyses are beyond the scope of the present paper (but are obviously of immediate and critical importance, and will be pursued elsewhere).

LD and Normal Children's Strategies. A continued contrast of strategy predictions reveals an overall difference between LD and normal children, in that the LD children are roughly a grade to a grade and a half behind their normal classmates, whether correct responses or strategies are considered. This finding is represented schematically in Figure 8.

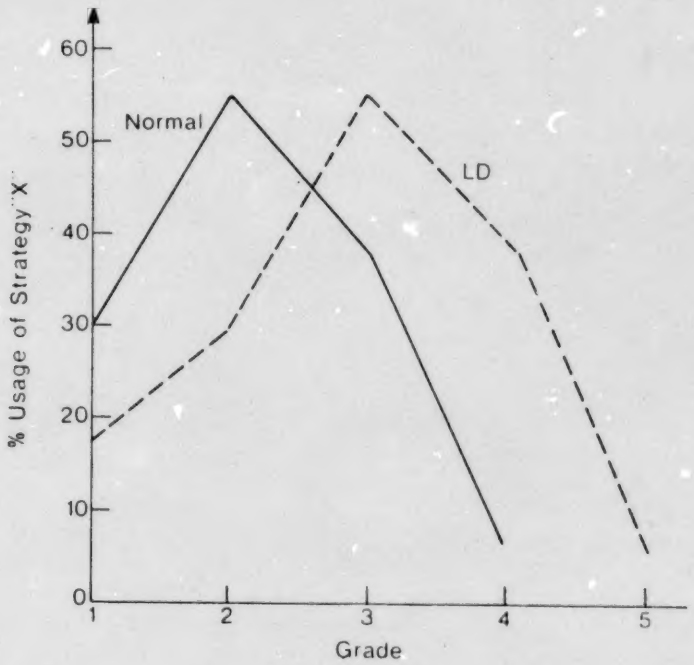

Figure 8

A Schematic Representation of Normal and LD's Use of Strategy X, by Grade.

It is vital, however, to consider the children individually, rather than to draw conclusions based on group data such as Figure 8. Recall the distribution of correct responses when normal and LD children were compared (Table 6). Some LD children were as correct as the most correct normals, and a few normals erred as frequently as the most erroneous LD's. When individual children are examined as to which strategies they use, some LD

children display an important difference from normals.

Suppose a normal second grade child makes 3 incorrect responses out of his 8 for the 2-way reversible Full Passive (9a). For virtually all normal children, the 3 responses will fall into one cell. We know precisely which cell: the child will apply S_2, and choose the picture in which the indian has a fat belly (and robs the sheriff). While occasionally a single child will try an unusual strategy and end up in a disfavored cell, in the main, when normal children in a given grade err, they do so into a specific cell. This is not the case for some of the LD children. Some, but not all, fall into scattered cells. This apparently does not result from linguistic randomness. (Remember the LD child who made 3 errors in the Baseline Passive, but none in the 2-way Reversible Passive.) These children apparently may scatter even when they know the structure being tested. (Knowledge can be demonstrated by comparing performance on minimal pairs of sentence types, such as Baseline Passive and 2-way reversible Full Passive, Active and SS, Truncated Passive and SO, etc.). As a tester, I had the strong feeling that sometimes some LD children simply stopped paying attention and pointed at random. Thus, the scatter characteristic looks like an attentional rather than a language variable, and may be depressing the LD scores overall, causing the effect of group difference to appear larger than it actually is.

Conclusion

When a group of LD children are compared in their comprehension of relative clauses with normal children matched for age and IQ, a massive difference in performance is found, supporting the existing literature that claims that learning disability involves a language deficit. I wish to argue to the contrary for both applied and theoretical reasons.

From the viewpoint of application, while there is a difference in means of about 1 year, the distribution of scores within each grade completely overlaps (Table 6). Knowing a child's language score does not enable us to predict if he is LD; nor, if we know that a child is learning disabled, can we predict his language score.

The literature on all varieties of deficiencies is replete with findings that show correlations between different kinds of deficiencies. These correlations are frequently used to classify children on the one hand (e.g. normal versus LD), and then to prescribe remediation (such as provide language training) on the other. While the present data do provide evidence of a correlation between learning and language deficiency, they also suggest great caution in going from correlation to intervention. Given the virtually complete overlap in the distribution of scores on language performance between the normals and the LDs, there is no basis to support an intervention strategy of providing language enrichment for any particular LD child. Some of

the LD children may have language deficiencies, but that cannot be determined simply from the assessment procedures for labeling a child "LD": it is necessary to assess his language.

The same caution would apply wherever there is substantial overlap in the distributions of LD and normals, whatever is being assessed, regardless of the magnitude of the mean difference.

For example, if LD children are found to be poorer than normals in their syntactic abilities (Vogel, 1975), or in production and comprehension of morphological structures (Wiig and Semel, 1976), or to be more impulsive and anxious than their normal siblings (Owen, Adams, Forrest, Stolz, and Fisher, 1971), or less persuasive when interacting with small groups of peers (Bryan, Donahue, and Pearl, in press), we must have evidence whether the 2 groups are non-overlapping.

On theoretical grounds, it is possible to question whether there is any relationship at all between learning disabled and language deficient. Thus, in spite of the highly significant differences between the means, the LD children's poorer scores on the language test may be entirely accounted for by attentional deficits or other reasons that have nothing to do with their language competence. Until we have a clearer picture of the constellation of factors that make up learning disablement, data such as these provide no basis for selecting language competence as either a cause or an effect of being learning disabled.

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